Radiation dose during the ground level enhancement on 10 September 2017

Ryuho Kataoka[1], Tatsuhiko Sato[2], and Shoko Miyake[3]
[1]*National Institute of Polar Research*
[2]*Japan Atomic Energy Agency*
[3]*National Institute of Technology, Ibaraki College*

Ground level enhancement (GLE) event occurred on 10 September 2017, associated with X8.2 solar flare exploded at western limb. We report the initial estimates of the possible radiation dose at flight altitudes as obtained from the WASAVIES (Kataoka et al., 2014). We succeeded to manually conduct the nowcast using WASAVIES, and we estimated the maximum radiaion dose at 11 km flight altitude as approximately 2.0 μSv/h, which was lower than the radiation dose of 6.0 μSv/h due to galactic cosmic rays. The best-fitted power-law index of the initial energy spectrum of protons is estimated as -6.0, which is softer than average. The best-fitted "injection parameter" of WASAVIES is also estimated as 3.0, which is longer time scale than average. We did not see significant north-south assymetry for this event. We discuss potential problems and solution of the atutomatic forecast using WASAVIES for future GLEs.

References

Kataoka, R., T. Sato, Y. Kubo, D. Shiota, T. Kuwabara, S. Yashiro, and H. Yasuda (2014), Radiation dose forecast of WASAVIES during ground level enhancement, Space Weather, 12, doi:10.1002/2014SW001053.